



PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 31317		FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/IL2006/000373		International filing date (day/month/year) 23.03.2006	Priority date (day/month/year) 23.03.2005	
International Patent Classification (IPC) or national classification and IPC INV. G06F3/033				
Applicant Epos Technologies Limited				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>14</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of <u>8</u> sheets, as follows:</p> <p style="margin-left: 20px;"><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 20px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand 2006-09-03		Date of completion of this report 27.08.2007		
Name and mailing address of the international preliminary examining authority:  European Patent Office - Gitschiner Str. 103 D-10958 Berlin Tel. +49 30 25901 - 0 Fax: +49 30 25901 - 840		Authorized officer Taylor, Paul Telephone No. +49 30 25901-438 		

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/IL2006/000373

Box No. I Basis of the report

1. With regard to the **language**, this report is based on
- ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-38 as originally filed

Claims, Numbers

1-49 received on 18.07.2007 with letter of 18.07.2007

Drawings, Sheets

1/30-30/30 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☒ the claims, Nos. 41
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>1-11,17-34,36-40,45-49</u>
	No: Claims	<u>12-16,35,41-44</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-49</u>
Industrial applicability (IA)	Yes: Claims	<u>1-49</u>
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Prior art documents

Reference may be made to the following documents:

D1: WO 03/069547 A1 (Anoto AB)
D2: WO 02/01466 A2 (Virtual Ink Corp.)
D3: WO 01/35329 A1 (Itpen Ltd.)
D4: US 2004/0032399 A1 (Sekiguchi et al.)
D5: US 4 991 148 A (Gilchrist)

2. Clarity - Article 6 PCT

- 2.1. The present application does not meet the requirements of Article 6 PCT since the claims are not concise.

In view of the nature of the subject-matter disclosed in the description of the present application, the number (13) of independent claims presently on file is excessive, which places an undue burden on the reader to determine precisely which features, or combination thereof, it is desired to protect (i.e. which features constitute the actual invention).

Moreover, in any further national/regional procedure, the applicant is advised that objections as to lack of unity may be raised, since the features of the independent claims as presently on file are so disparate that they do not appear, at first glance, to satisfy the requirements of Rule 13 PCT. It cannot be argued that, for example, claim 1 has one or more special technical features identical to or corresponding to those of claims 26, 33, 39, 41 and 47. In addition, the features of many of the independent claims are either known from, or obvious with respect to, the prior art (see section 3 below).

- 2.2. In addition to the above, dependent claim 32 is not clear because it contains the incomprehensible phrase "further comprising a map, configured to graphically map said predefined area, so as to assist a user in positioning the digital pen in said predefined area". It is not apparent what this is supposed to mean, even with reference to the description, since this phrase is also used there (on page 7, lines 18-19) without any further explanation.
- 2.3. Amended independent claim 41 is not fully supported by the description, since there is no basis in the application as originally filed that the resilient element of the smooth contact switch is "smoothly compressible" or that the electric circuit is "smoothly" closed. This IPRP has been issued as if the claim had not been amended.

3. Novelty and Inventive step- Article 33(2) and 33(3) PCT

Notwithstanding the above objections to lack of clarity, the following observations on novelty and inventive step are made:

3.1. Independent claim 1

Digital pen comprising an electric circuit, an acoustic transmitter detached from said circuit and a resilient holder for electrically connecting a first electrical circuit with a second electrical circuit on application of mechanical pressure.

Document D1 has been identified as the closest prior art and discloses, the numerals in parentheses referring to this document:

a digital pen (10) comprising an electric circuit (32), a communications unit (26) and a resilient holder (18) configured to electrically connect electric circuit (32) with communications unit (26) on application of mechanical pressure (see figures 1-4C and page 8, line 25 - page 10, line 6).

D1 thus differs from the subject-matter of claim 1 in that:

- i. the communications unit (i.e. transmitter) (26) is not necessarily acoustic.

- ii. the holder does not mechanically press said electric circuit into electrical contact with the transmitter.

Therefore, the subject-matter of claim 1 is novel in the sense of Article 33(2) PCT.

The two identified differences are considered to be an juxtaposition of features, since no synergistic effect can be ascertained i.e. they do not produce any non-obvious working interrelationship. Therefore, for the purpose of assessing inventive step, these features will be considered separately.

- (1) Feature (i) addresses the problem of how the digital pen communicates with a sensing apparatus. The person skilled in the art is aware that he can choose from various options, including triangulation of electromagnetic or acoustic signals. D1 expressly mentions this (see page 1, lines 5-19). Thus, the skilled person would choose the precise form of communications unit according to the brief he is given and would provide the device of D1 with an acoustic transmitter if this were required.
- (2) Feature (ii) addresses the problem of how and when an electrical connection is established between two electrical circuits.

In D1, the force sensor (16) is mechanically pressed to close the circuit such that the electronics in the pen, including the PCB (20), communications unit and sensor (32), are powered on. The device of D1 therefore achieves the same objectives but uses a slightly different construction. For a skilled person, however, the difference amounts to a design choice since, in both cases, he is using a resilient holder which is subject to mechanical pressure to establish an electrical contact between the circuits.

Since he need expend no inventive activity in equipping the device of D1 to arrive at the subject-matter of claim 1, the subject-matter of this claim does not involve an inventive step in the sense of Article 33(3) PCT.

3.2. Independent claim 9

The subject-matter of claim 9 relates to the construction and form of a resilient holder configured for locating two electric circuits thereon within the confines of a housing so as to bring about an electrical contact between them.

D1 differs from the subject-matter of the claim in that: the two circuits are located on the holder.

The problem addressed by this difference can be formulated as being how to improve the electrical connection between the two circuits.

This is considered obvious to the skilled person in view of D1 (see figures 1, 2, 3b and 4, page 13, lines 4-11), especially when taking into account what the application means by "due to the confinement within a housing" (see pages 17-18 of the description of the present application). The circuits in D1 are contained in the confines of a housing and a resilient holder is provided to enable electrical contact to be made between a first circuit (20) and a second circuit (32). The first circuit is mounted on the resilient holder (D1 uses the word "against" (see page 13, lines 7-11), but the spatial and functional relationship is the same). It is an obvious measure for the skilled person that, if he can mount one circuit on a holder, he can equally mount a second. Indeed, if one were to consider the force sensor of D1 as an electric circuit- it is, after all, electrically conductive-, the skilled person is expressly hinted in this direction by D1.

For these reasons, the subject-matter of independent claim 9 is not considered to involve an inventive step in the sense of Article 33(3) PCT.

3.3. Independent claim 10

Digital pen comprising an acoustic transmitter and a switch assembly having 3 modes depending on how switch is pressed:

Multi-mode rocker switches having three operating modes (i.e. pressing either end of the rocker to make a contact or pressing it down in its centre, or even simultaneously at both ends, to create another detectable contact) are well-known in the prior art,

across many technical fields. It must be assumed that the skilled person wishing to equip a digital pen with such a switch would unhesitatingly consult an expert in the field of switches to obtain one that meets his requirements. The use of a multi-mode rocker switch on a digital pen does not alter the way in which the switch work and, as such, does not produce any non-obvious or unusual technical effects.

For these reasons, the subject-matter of claim 10 cannot be considered to involve an inventive step in the sense of Article 33(3) PCT.

3.4. Independent claim 12

Digital pen having a pen tip, acoustic transmitter proximate to pen tip and a smooth contact switch):

known from e.g. D2 (see figs 1A, 2B and page 4, line 30 - page 5, line 19), D3 (see fig. 2 and page 22, line 12- page 23, line 5) and D4 (see fig. 2A and paragraph [0042]).

Hence, the subject-matter of claim 12 is not novel in the sense of Article 33(2) PCT.

3.5. Independent claim 20

Digital pen having elongated body, writing element protruding from a writing tip, acoustic transmitter and a rotating cover to selectively cover and expose writing element.

This can be considered to be an obvious measure to the person skilled in the art of digital pens, since he is aware that digital pens are designed to have the ease of use of conventional pens and that they, in many cases, also have means for writing, such as ink, in addition to acoustic or IR transmitters, such that they can be used like ordinary (i.e. non digital) pens. If the person skilled in the art were given the brief to develop a digital pen having a retractable tip, by using a rotatable cover, he would immediately look to the field of ordinary pens for solutions to this problem and would use the most appropriate solution from that field without modification- bar the obvious

necessity of mounting an acoustic transmitter in a suitable manner, which latter is in any case part of his normal activities. It should be pointed out that some conventional pens have "retractable" tips that are, in fact, fixed- the covering and exposing of the tip is performed by moving the barrel or a sleeve.

For these reasons, the subject-matter of claim 20 cannot be considered to involve an inventive step in the sense of Article 33(3) PCT.

3.6. Independent claim 21

Refers to a digital pen having a writing element on a retractable writing tip (tip is attached to an elongated body that is moveable inside housing to selectively cover or expose writing element). This can be considered to be an obvious measure to the person skilled in the art of digital pens for the same reasons as given in section 3.5 above

For these reasons, the subject-matter of claim 21 cannot be considered to involve an inventive step in the sense of Article 33(3) PCT.

3.7. Independent claim 24

Relates to a digital pen having an acoustic waveguide in the form of a plurality of fins radiating outwardly in a direction away from acoustic signal transmitter.

Referring to document D2 and, especially, figures 1A and 1B in combination with page 8, lines 6-12, it would appear that the cage 21 protecting the acoustic transmitter also functions as a waveguide, though no details of such use are explicitly given, especially in view of the form of the cage shown in figures 1A and 1B.

Having knowledge of D2, the skilled person would arrive at the subject-matter of claim 24, without adaptation, meaning that it does not involve an inventive step in the sense of Article 33(3) PCT.

Independent claim 26

Relates to a receiving unit for receiving an acoustic signal from a digital pen having at least two ultrasound receivers and an electric circuit for extracting ultrasound signals using a reference model.

This is known from D5 (see figures 1, 2, 7-11 and col. 6, line 13 - col. 8, line 58), apart from one difference: D5 does not teach the use of a reference model.

Hence, the subject-matter of claim 26 is novel in the sense of Article 33(2) PCT.

The sole difference to D5 (use of a reference model comprising data pertaining to expected reference signals) cannot be used to establish an inventive step because it is a widespread technique in processing signals from sensors, also in ultrasound applications. Since look up tables or libraries of reference signals (these are what the present application means by reference model) are well-known in the domain of signal processing, and triangulation of signals from a movable member by using more than one sensor is a similarly well-known technique, they are considered to form part of the common general knowledge of the person skilled in the art.

Hence, the skilled person would need no more than his general knowledge to arrive at the subject-matter of claim 26 which, therefore, does not involve an inventive step in the sense of Article 33(3) PCT.

3.9. Independent claim 31

Relates to the use of a digital pen having a construction identical to that of claim 1 with a receiver for determining its position. Since the construction of the pen is not considered to be inventive (see section 3.1.) and the use of a digital pen in combination with a receiver is known, as clearly demonstrated by the documents cited in the international search report, the subject-matter of this claim does not involve an inventive step in the sense of Article 33(3) PCT.

3.10. Independent claim 33

Relates to the use of a digital pen having a construction identical to that of claim 10 with a receiver for determining its position. Since the construction of the pen is not considered to be inventive (see section 3.3.) and the use of a digital pen in combination with a receiver is known, as clearly demonstrated by the documents cited in the international search report, the subject-matter of this claim does not involve an inventive step in the sense of Article 33(3) PCT.

3.11. Independent claim 35

Relates to the use of a digital pen having a construction identical to that of claim 12 with a receiver for determining its position. The construction and use of the smooth contact switch is disclosed in D2 (see same references as in 3.4. above, especially figures 4A and 4B) and the use of a digital pen in conjunction with a receiving unit is known (see documents cited in the ISR).

Hence, the subject-matter of claim 35 cannot be considered to involve an inventive step in the sense of Article 33(3) PCT.

3.12. Independent claim 37

Relates to the use of a digital pen with a receiving unit having at least two ultrasound receivers and extracting signals using a reference model.

This is disclosed in D5 (see same references as given in 3.8. above with respect to claim 26).

Hence, the subject-matter of claim 37 is not novel in the sense of Article 33(2) PCT.

3.13. Independent claim 39

Relates to a digital pen and a receiving unit in which at least two receivers are placed and further having a processor to process the received signals, the receiving unit being attached to a corner of a surface using a securing plate.

The only difference between the subject-matter of this claim and the disclosure of D4 is the precise form of the fixation means.

However, this is tantamount to a design choice since D4 achieves the same objective i.e. it expressly teaches the fixing of a receiving unit to the right-angled corner of a surface (see figure 1 and paragraph [0043]).

Hence, the subject-matter of claim 39 cannot be considered to meet the requirements of Article 33(3) PCT since it does not involve an inventive step.

3.14. Independent claim 41

Relates to a smooth contact switch having a resilient element compressible into a position for closing an electric circuit.

This is disclosed in D2 (see figures 4A, 4B), hence the subject-matter of claim 41 is not novel in the sense of Article 33(2) PCT.

3.15. Independent claim 47

Relates to a digital sleeve having an acoustic transmitter and mountable on a writing instrument configured to detect a predefined movement of the writing instrument in relation to the digital sleeve.

Although no further details are given in the description of the present application as to what the "predetermined movement" is supposed to mean, it is obvious to the skilled person that he can use the disclosure of D3 (see especially figs 6A-6C) without adaptation to arrive at the subject-matter of claim 47.

Hence, the subject-matter of independent claim 47 does not involve an inventive step in the sense of Article 33(3) PCT.

3.16. Dependent claims

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Regarding claims 2, 5 and 6 (construction of resilient holder): known from D1 (see figures 2 and 4).

Regarding claim 3 (transmitter is an ultrasound transducer)- obvious from prior art (see any of D2-D5).

Regarding claim 4 (resilient holder is electrically conductive): not apparent which problem this is supposed to solve in view of its function, as defined in claim 1, being to mechanically press one electric circuit into electrical contact with another.

Regarding claim 6 (housing applies mechanical pressure on holder): known from D1 (see fig. 1).

Regarding claim 7 (housing of pen has changeable cover): a design consideration

Regarding claim 8 (pen comprises a plurality of infra red emitters): obvious to the skilled person (redundancy in case of defect or obstruction).

Regarding claim 11 (switch formed of rod and fulcrum): constructional feature of three mode rocker switches,

Regarding claims 13-16 and 42-44 (construction of smooth contact switch and its activation): known from D2 (see figs 4A, 4B and accompanying text).

Regarding claims 17, 18, 45 and 46 (pressure required to activate switch and compression of resilient element): obvious to the skilled person, who would determine the optimum values for these by experimenting, which forms part of his normal activities.

Regarding claim 19 (writing pressure on smooth contact switch is generated on digital pen touching a surface): known from each of D2-D5.

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Regarding claim 22 (spring urges elongated body into position such that writing tip is covered): a conventional means of providing a retractable writing tip in, for example, retractable ball point pens. Its use in a digital pen is obvious to the skilled person since he would look to the field of conventional pens for solutions applicable to digital pens.

Regarding claim 25 (fins positioned to divide region about transmitter into plural directional sectors): considered to be obvious for the skilled person having knowledge of D2 (see figs 1A, 1B).

Regarding claim 27 (ultrasound receivers at least one of electret microphones or MEMS microphones (known from D5- see col. 5, lines 47-50)).

Regarding claims 28, 30, 37, 38 and 40 (receiving unit has housing and attachment device for attaching unit to another item): housing is disclosed in D3 and D4, attachment device an obvious design consideration for the skilled person when given the brief to make the unit securely attachable and removable to another device/item.

Regarding claim 29 (ultrasound receivers are less than 65 mm apart): an arbitrary choice for the reasons given in section 3.15 above therefore not inventive.

Regarding claims 34 and 36 (processor associated with receiving unit detects mode of digital pen and actuation of pen): known from e.g. EP 1 450 296, cited in the international search report (see paragraph [0023]).

Regarding claim 48 (securing plate of receiver unit is configured to fit middle position of a paper sheet): it must be expected that the skilled person will design the attachment means taking into account the location where he intends to place the receiver unit, which forms part of his everyday normal activities. Hence, this cannot be considered as inventive.

Regarding claim 49 (right-angled corner is a corner of a sheet of paper): known from D4 (see fig.1 and paragraph [0043]).